UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

2292	7590	02/23/2010

BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER
PATEL, JAYESH A

ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 02/23/2010

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,686	05/09/2006	Satoshi Yamanaka	1190-0625PUS1	3665

TITLE OF INVENTION: MEAN PRESERVING INTERPOLATION CALCULATION CIRCUIT, PIXEL INTERPOLATION CIRCUIT, MEAN PRESERVING INTERPOLATION METHOD, AND PIXEL INTERPOLATION METHOD

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1510	$300	$0	$1810	05/24/2010

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS** FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: <u>Mail</u>   **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or <u>Fax</u>   **(571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

```
2292        7590        02/23/2010
```

BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

_____ (Depositor's name)

_____ (Signature)

_____ (Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,686	05/09/2006	Satoshi Yamanaka	1190-0625PUS1	3665

TITLE OF INVENTION: MEAN PRESERVING INTERPOLATION CALCULATION CIRCUIT, PIXEL INTERPOLATION CIRCUIT, MEAN PRESERVING INTERPOLATION METHOD, AND PIXEL INTERPOLATION METHOD

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1510	$300	$0	$1810	05/24/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
PATEL, JAYESH A	2624	382-300000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE   (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) :   ❑ Individual   ❑ Corporation or other private group entity   ❑ Government

4a. The following fee(s) are submitted:

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)

❑ A check is enclosed.

❑ Payment by credit card. Form PTO-2038 is attached.

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

❑ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.   ❑ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____   Date _____

Typed or printed name _____   Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,686	05/09/2006	Satoshi Yamanaka	1190-0625PUS1	3665

2292	7590	02/23/2010	

BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER
PATEL, JAYESH A

ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 02/23/2010

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 802 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 802 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

	Application No.	Applicant(s)
Notice of Allowability	10/578,686	YAMANAKA ET AL.
	Examiner	Art Unit
	JAYESH PATEL	2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to <u>Amendments/remarks filed on 12/10/2009</u>.

2. ☒ The allowed claim(s) is/are <u>1-20</u>.

3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

      a) ☒ All   b) ☐ Some* c) ☐ None of the:

          1. ☒ Certified copies of the priority documents have been received.

          2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

          3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

     * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

        1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application

6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .

7. ☒ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .

/JAYESH PATEL/
Patent Examiner, Art Unit 2624

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes

and/or additions be unacceptable to applicant, an amendment may be filed as

provided by 37 CFR 1.312. To ensure consideration of such an amendment, it

MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview

with Mr. Ali M Imam. (Reg # 58755) on Jan 27 2010.

The application has been amended as follows:

Claim 1. (Currently Amended) A mean preserving interpolation calculation circuit

that obtains interpolation data for a missing pixel such that a mean value of a

sequence of pixels constituting a group of pixels including the missing pixel is

equal to a mean value of another sequence of pixels constituting a group of

pixels not including the missing pixel, wherein the number of pixels constituting

the group of pixels including the missing pixel and the number of pixels

constituting the group of pixels not including the missing pixel are [[both]] each

k, [[(]] k being a positive integer [[)]].

Claim 5. (Currently Amended) The mean preserving interpolation calculation

circuit of claim 2, wherein each said group of pixels constitutes a portion of a

periodically varying series of pixels, i pixels, [[(]] i being a positive integer [[)]] in

the pixels constituting the group of pixels not including the missing pixel coincide

with i pixels in the pixels constituting the group of pixels including the missing

pixel, and said k or a value obtained by subtracting said i from said k is set to a

value substantially equal to a period of pixel variation represented by a number of

pixels, or to an integer multiple thereof.

Claim 6. (Currently Amended) A pixel interpolation circuit comprising: [[the

mean preserving interpolation calculation circuit of claim 1]] a mean preserving

interpolation calculation circuit that obtains interpolation data for a missing pixel

such that a mean value of a sequence of pixels constituting a group of pixels

including the missing pixel is equal to a mean value of another sequence of

pixels constituting a group of pixels not including the missing pixel, wherein the

number of pixels constituting the group of pixels including the missing pixel and

the number of pixels constituting the group of pixels not including the missing

pixel are each k, k being a positive integer; and a circuit using maximum and

minimum values of pixels in a neighborhood of the missing pixel to limit the

output range of the interpolation data obtained by the mean preserving

interpolation calculation circuit.

Claim 7. (Currently Amended) A pixel interpolation circuit comprising: a

plurality of mean preserving interpolation calculation circuits [[as recited in claim

5,]] each obtaining interpolation data for a missing pixel such that a mean value

of a sequence of pixels constituting a group of pixels including the missing pixel

is equal to a mean value of another sequence of pixels constituting a group of pixels not including the missing pixel, wherein the number of pixels constituting the group of pixels including the missing pixel and the number of pixels constituting the group of pixels not including the missing pixel are each k, k being a positive integer, wherein each of the plurality of mean preserving interpolation calculation circuits comprises:

an incomplete total calculation circuit for obtaining a total of values of the pixels other than the missing pixel in the k pixels constituting the group of pixels including the missing pixel;

a complete total calculation circuit for obtaining a total of values of the k pixels constituting the group of pixels not including the missing pixel; and

a difference circuit for obtaining interpolation data for the missing pixel by subtracting an output of the complete total calculation circuit from an output of the incomplete total calculation circuit, wherein

each said group of pixels constitutes a portion of a periodically varying series of pixels, i pixels, i being a positive integer, in the pixels constituting the group of pixels not including the missing pixel coincide with i pixels in the pixels constituting the group of pixels including the missing pixel, and said k or a value obtained by subtracting said i from said k is set to a value substantially equal to a period of pixel variation represented by a number of pixels, or to an integer multiple thereof, and wherein each of the mean preserving interpolation calculation circuits have different values of said k or (k - i), and wherein the pixel

interpolation circuit further comprising an output circuit, the plurality of mean preserving interpolation calculation circuits generating respective interpolation data for the missing pixel, the output circuit selecting one of the interpolation data output by the plurality of mean preserving interpolation calculation circuits and outputting the selected data as the interpolation data for the missing pixel.

Claim 13. (Currently Amended) A mean preserving interpolation calculation method that obtains interpolation data for a missing pixel such that a mean value of a sequence of pixels constituting a group of pixels including the missing pixel is equal to a mean value of another sequence of pixels constituting a group of pixels not including the missing pixel, wherein the number of pixels constituting the group of pixels including the missing pixel and the number of pixels constituting the group of pixels not including the missing pixel are [[both]] each k, [[(]] k being a positive integer [[)]].

Claim 17. (Currently Amended) The mean preserving interpolation calculation method of claim 14, wherein each said group of pixels constitutes a portion of a periodically varying series of pixels i pixels, [[(]] i being a positive integer [[)]] in the pixels constituting the group of pixels not including the missing pixel coincide with i pixels in the pixels constituting the group of pixels including the missing pixel, and said k or a value obtained by subtracting said i from said k

is set to a value substantially equal to a period of pixel variation represented

by a number of pixels, or to an integer multiple thereof.

Claim 18. (Currently Amended) A pixel interpolation method comprising:

a mean preserving interpolation calculation step that obtains interpolation data

for a missing pixel such that a mean value of a sequence of pixels constituting a

group of pixels including the missing pixel is equal to a mean value of another

sequence of pixels constituting a group of pixels not including the missing pixel,

wherein the number of pixels constituting the group of pixels including the

missing pixel and the number of pixels constituting the group of pixels not

including the missing pixel are each k, k being a positive integer; and a

[[further]] step of using maximum and minimum values of pixels in a

neighborhood of the missing pixel to limit the output range of the interpolation

data obtained by the mean preserving interpolation calculation **[[method of**

claim 13]] step.

Claim 19. (Currently Amended)   A pixel interpolation method comprising:

a plurality of mean preserving interpolation calculation steps each obtaining

interpolation data for a missing pixel such that a mean value of a sequence of

pixels constituting a group of pixels including the missing pixel is equal to a mean

value of another sequence of pixels constituting a group of pixels not including

the missing pixel, wherein the number of pixels constituting the group of pixels

including the missing pixel and the number of pixels constituting the group of pixels not including the missing pixel are each k, k being a positive integer; wherein each of the mean preserving interpolation calculation steps comprises: an incomplete total calculation step for obtaining a total of values of the pixels other than the missing pixel in the k pixels constituting the group of pixels including the missing pixel; a complete total calculation step for obtaining a total of values of the k pixels constituting the group of pixels not including the missing pixel; and a difference step for obtaining interpolation data for the missing pixel by subtracting an output of the complete total calculation step from an output of the incomplete total calculation step, wherein each said group of pixels constitutes a portion of a periodically varying series of pixels, i pixels, i being a positive integer, in the pixels constituting the group of pixels not including the missing pixel coincide with i pixels in the pixels constituting the group of pixels including the missing pixel, and said k or a value obtained by subtracting said i from said k is set to a value substantially equal to a period of pixel variation represented by a number of pixels, or to an integer multiple thereof; and wherein each of the mean preserving interpolation calculation step **[[of claim 17]]** is performed with different values of said k or (k - i), each time generating interpolation data for the missing pixel, and the output step selects one of the interpolation data output by the plurality of mean preserving interpolation calculation steps and outputs the selected data as the interpolation data for the missing pixel.

REASONS FOR ALLOWANCE

The following is an examiner's statement of reasons for allowance: In view of the amendments/remarks dated 12/10/2009 and the prior arts cited on PTO 892, Independent claims 1,6,7,13, 18-19 are allowed. Claims 2-5,8-12, 14-17 and 20 depends directly or indirectly on the independent claims1,6,7,13, 18-19 and therefore they are allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAYESH PATEL whose telephone number is (571)270-1227. The examiner can normally be reached on 5-4-9.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed can be reached on 571-272-7413. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-

direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-

free). If you would like assistance from a USPTO Customer Service

Representative or access to the automated information system, call 800-786-

9199 (IN USA OR CANADA) or 571-272-1000.

2/4/2010

/JAYESH PATEL/
Examiner, Art Unit 2624

/Samir A. Ahmed/
Supervisory Patent Examiner, Art Unit 2624